AMENDMENTS TO THE CLAIMS:

The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently amended) A method of detecting a clonal population of cells in a biological sample, said method comprising co-localising mitochondrial DNA derived from said sample, which co-localisation is based on nucleotide sequence identity, and qualitatively and/or quantitatively detecting the levels of said co-localised mitochondrial DNA wherein a higher level of a co-localised mitochondrial DNA population relative to background levels is indicative of the presence of a clonal population of non-neoplastic cells ~~characteristic of a leukaemia, lymphoma, myeloma, myelodysplasia, polycythaemia vera or a myeloproliferative syndrome~~.

2. (Currently amended) A method for diagnosing and/or monitoring a clonal population of non-neoplastic cells in a mammal, said method comprising co-localising mitochondrial DNA derived from a biological sample derived from said mammal, which co-localisation is based on nucleotide sequence identity, and qualitatively and/or quantitatively detecting the levels of said co-localised mitochondrial DNA wherein a higher level of a co-localised mitochondrial DNA population relative to background levels is indicative of the presence of a clonal population of non-neoplastic cells ~~characteristic of a leukaemia, lymphoma, myeloma, myelodysplasia, polycythaemia vera or a myeloproliferative syndrome~~.

3-12. (Canceled)

13. (Previously presented) The method according to claim 1 or 2, wherein said mitochondrial DNA is mitochondrial D loop DNA.

14. (Canceled)

15. (Previously presented) The method according to claims 1 or 2 wherein said co-localisation is achieved utilising any one of the techniques of:

(i) Denaturing gradient electrophoresis

(ii) Temperature gradient denaturing electrophoresis

(iii) Constant denaturing electrophoresis

(iv) Single strand conformational electrophoresis

(v) Denaturing high performance liquid chromatography

(vi) Microassays

(vii) Mass spectrometry

16. (Previously presented) The method according to claim 1 or 2 wherein said co-localisation is achieved utilising denaturing gel or capillary electrophoresis.

17. (Currently amended) A method for diagnosing and/or ~~leukaemia, lymphoma, myeloma,~~ a non-neoplastic disease condition ~~myelodysplasia, polycythaemia vera or a myeloproliferative syndrome~~, said method comprising co-localising mitochondrial DNA derived from a biological sample derived from said mammal, which co-localisation is based on nucleotide sequence identity and qualitatively and/or quantitatively detecting the levels of said co-localised mitochondrial DNA wherein a higher level of the co-localised mitochondrial DNA population relative to background levels is indicative of the presence of a clonal population of non-neoplastic cells ~~characteristic of leukaemia, lymphoma, myeloma, myelodysplasia, polycythaemia vera or a myeloproliferative syndrome~~.

18-27. (Canceled)

28. (Currently amended) The method according to claim 17 or 33 ~~or 20,~~ wherein said mitochondrial DNA is mitochondrial D loop DNA.

29. (Canceled)

30. (Currently amended) The method according to claims 17 or 33~~or 20~~ wherein said co-localisation is achieved utilising any one of the techniques of:

(i) Denaturing gradient electrophoresis.

(ii) Temperature gradient denaturing electrophoresis

(iii) Constant denaturing electrophoresis

(iv) Single strand conformational electrophoresis

(v) Denaturing high performance liquid chromatography

(vi) Microassays

(vii) Mass spectrometry

31. (Currently amended) The method according to claim 17 or 33 ~~or 20~~ wherein said co-localisation is achieved utilising denaturing gel or capillary electrophoresis.

32. (New) The method according to claim 1 or 2 wherein said non-neoplastic of cells correspond to a myleodysplasia, polycythacemia vera or a myeloproliferative syndrome.

33. (New) The method according to claim 17 wherein said disease condition is myelodysplasia, polycythaemia vera or a myeloproliferative syndrome.